progression is €150,000–350,000 for each therapy but glatiramer acetate (€651,796). Probabilistic sensitivity analysis confirmed subcutaneous interferon beta-1a and interferon beta-1b as the most cost-effective therapies (confidence intervals remained below €45,000 per avoided relapse). Estimated budget impact of assuming 5–9% annual increase of subcutaneous interferon beta-1a market share equals 0.17–0.52% of actual RRMS cost in Spain. **CONCLUSIONS**: Subcutaneous interferon beta-1a is an efficient strategy for RRMS in Spain as it allows an appropriate management and treatment of RRMS relapses and progression with a minor budgetary impact for SNHS.

PND9

COST-EFFECTIVENESS AND BUDGET IMPACT MODELLING OF LACOSAMIDE IN THE TREATMENT OF PARTIAL-ONSET SEIZURES IN FINLAND

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OBJECTIVES: Economic evaluation of Lacosamide (LCM) and standard treatment with commonly used antiepileptic drugs (ST) vs. ST alone in the Finnish setting. LCM is a new antiepileptic drug, indicated for adjunctive treatment of partial-onset seizures (POS) with or without secondary generalisation in patients aged 16 years and older. **METHODS**: A probabilistic decision tree based cost-effectiveness analysis (CEA) with second-order Monte Carlo simulation and a 2-year time-frame was performed in Excel from the Finnish societal perspective (productivity losses and VAT excluded). The efficacy data were obtained from the LCM-trials, and the Finnish costs (inpatient, outpatient, GP, laboratory, drug) and utilities from published studies. Budget impact modelling (BIM) with a five year time-frame was done to assess the net monetary impact of LCM launch to the refractory epilepsy budget. Only drug costs were included in BIM. Conservatively, generic prices were used in all analyses. **RESULTS**: According to CEA, LCM+ST was associated with an incremental cost of €945 (mainly related to seizure management and drug acquisition), a gain of 0.040 QALYs and 8.92 seizures avoided compared to ST alone. LCM+ST was associated with a cost of €23,396 per QALY gained and €106 per seizure avoided compared to ST alone. According to the cost-effectiveness acceptability frontier, the probability of LCM's cost-effectiveness was 67.9% and 85.6% with €30,000 and €50,000 per QALY gained, respectively. The results were robust in sensitivity analyses. According to BIM, the expected annual budget increase due to launch of LCM is €0 in 2008, €7,653 in 2009, €47,350 in 2010, €134,949 in 2011, and €232,609 in 2012. The relative increase in the annual epilepsy budget due to LCM is 0.08% in 2009, 0.46% in 2010, 1.31% in 2011, and 2.23% in 2012. **CONCLUSIONS**: LCM is a valuable option for POS treatment because of its potential cost-effectiveness and low budget impact.

PND10

COST ANALYSIS OF ACTIVA RC®: RECHARGABLE NEUROESTIMULATOR FOR DEEP BRAIN ESTIMULATION THERAPY (DBS)

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OBJECTIVES: Neurostimulators (NS) for DBS are replaced when the battery goes to an end-of-life (EOL). Activa® RC, Medtronic's new rechargeable NS, offers guaranteed 9 years longevity. The objective was to perform a cost analysis of Activa® RC, vs. Kinetra® (previous non-rechargeable NS), based on the number of EOL replacements needed. **METHODS**: The following costs were included (hospital perspective, €, 2009): 1) DBS acquisition costs; 2) surgical procedure cost: Spanish tariff for Parkinson disease surgery; 3) EOL NS's replacement procedure cost: includes surgical procedure cost (excluding the acquisition costs of therapy components) and the NS cost. The EOL depends on patient energy requirements (disease-related) and on the NS: Kinetra®: dystonia patients replacements every 2 years; Parkinson disease, every 3–4 years; essential tremor, every 4–5 years(expert opinion). Activa® RC: every 9 years for all indications. Cumulative costs/year was obtained for a 9-years timeframe to compare the costs and number of surgical replacements avoided with Activa® RC. The main cost driver, surgical procedure cost, was changed as a sensitivity analysis (SA). **RESULTS**: Thanks to higher battery longevity, the following savings could be obtained: 1) Dystonia patients, as higher energy requirement are needed, higher economic benefits are observed: at year €9, 57.585 saved/patient or 4 EOL-replacement avoided; 2) Parkinson disease, at year 9, 2 replacements are avoided, that represents €21.867 saved/patient; 3) Essential tremor, savings oscillates between €4.008-€21.867, avoiding 1–2 EOL-replacement in 9 years. **CONCLUSIONS**: Although initial acquisition costs of Activa® RC are higher, compared to Kinetra®, those are compensated after the first Kinetra®'s EOL surgical replacement, obtaining important cost savings at year 9 (4.008€-57.585€/patient), avoiding 1–4 surgical replacements. The more energy requirements, the higher economic benefits are observed with Activa® RC. An adequate patient selection is needed to maximize clinical and economic benefits of Activa® RC-DBS.

PND11

NEW ACTIVA PC® FAMILY: COST ANALYSIS OF THE NEW FEATURES FOR DEEP BRAIN STIMULATION THERAPY (DBS)

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OBJECTIVES: Activa®, Medtronic's DBS, is an effective,safe and reversible therapy for Parkinson disease, essential tremor and dystonia. A cost analysis was perform to estimate the economic benefits related to 2 features of Activa PC® family, new DBS generation devices, and the net Budget impact (BI) for Spanish hospitals, compared to Kinetra®. **METHODS**: The 2 features: neurostimulator's (NE) lower size and new stretchable extensions; both can avoid some adverse events (AEs) associated with Kinetra (no other benefits were considered). A literature search was done to retrieve safety studies. Selection criteria: AEs related with NE &/or the extension, their incidence and detailed treatment description. Health resource use was assigned to AEs treatment (Spanish hospital costs, Euros 2009): regional tariffs; acquisition costs. A net cost for each AEs was obtained, multiplying each AEs treatment incidence by its total cost. Total cost obtained with Activa PC®, compared to Kinetra®, corresponds to savings/patient. The net BI for Spanish hospitals was calculated: total incremental cost/Activa PC® treated patient instead of Kinetra® (considering AEs avoided and its savings). An AE incidence comparison was made as a sensitivity analysis (SA). **RESULTS**: 2 safety studies were selected. The 2 features could avoid 6 AEs, 2 related to NEs (hematoma in the NE implant site; infection/erosion); 4 with the extension (lead broke after a fall; extension fracture; skin ulceration in the connector; local discomfort). In total, avoiding these AEs involved 591€ saved/patient treated with Activa PC® family (SA obtained similar data). Including Activa PC® instead of Kinetra family in Spanish Hospitals involved a net BI per patient of €1.781. **CONCLUSIONS**: The new Activa PC family may avoid AEs related to the previous generation, Kinetra, with a decrease in the total cost per patient. The substitution of Kinetra® for Activa PC® family involves a small net budget impact per patient.

PND12

COST AND RESOURCE USE RELATED TO NEWLY DIAGNOSED MULTIPLE SCLEROSIS: REAL-WORLD DATA FROM A LARGE US CLAIMS DATABASE

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OBJECTIVES: To examine the economic burden of newly diagnosed multiple sclerosis (MS) on the US health care system using a large, managed care database. **METHODS**: This was a retrospective cohort analysis of a large, US claims database. Cases were defined as having either an MS diagnosis (ICD-9-CM 340) on at least 2 claims or 1 prescription for MS treatment (glatiramer acetate, interferon betas, or natalizumab) between 2004 and 2006. The index date was the first qualifying diagnosis or prescription. We excluded patients with an MS diagnosis or treatment over the 12 month pre-index period, or without continuous enrollment from 12 months pre- to 12 months post-index date. Each case had 5 controls without MS diagnoses or treatment matched on geographic region, insurance type, gender, relation to employee, age and lack of comorbid conditions with a similar period of continuous enrollment. Use of services was compared using chi-square tests, and 2008 adjusted costs were compared using the Wilcoxon rank-sum nonparametric tests. **RESULTS**: There were 1412 cases and 7,060 matched controls in the study. Sixty-six percent of the study population was female. MS patients were twice as likely to have emergency department (ED) visits (25.5% vs. 12.2%), 1.3 times as likely to have physician office visits (95.8% vs. 75.1%), and 2.4 times as likely to have used physical therapy (all p-values <0.001) services over the follow-up period. MS patients also had higher costs related to these services ($380 vs. $166, $614 vs. $228, and $268 vs. $74, respectively; all p-values <0.001). Total costs for MS patients were significantly higher than for controls ($16,984 vs. $3,639 $p < 0.001$). **CONCLUSIONS**: Newly diagnosed MS patients present a large burden on the health care system with additional 1st-year cost of over $13,000. While MS treatment drugs are expensive, this represents only one-third of the additional cost of care within the 1st year.

PND13

IMPACT OF CHRONIC (CM) AND EPISODIC MIGRAINE (EM) ON WORK PRESENTEEISM IN 9 COUNTRIES

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OBJECTIVES: Migraine is prevalent, and headache-related disability can impact the ability of migraineurs to work and perform daily activities. This study examined the impact of CM compared to EM on work patterns and productivity across countries. **METHODS**: Web-based survey data were collected from migraineurs in the US, Canada, Germany, UK, France, Italy, Spain, Australia, and Taiwan. According to ICHD-2 criteria, presence of migraine (past 3-months headaches with pain, nausea, and photophobia/phonophobia) and ≥15 headache days/month indicated CM, and <14 headache days/month indicated EM. Questions on absenteeism and presenteeism (reduced efficiency) in the preceding 4 weeks assessed headache impact on work or school. Linear and logistic regressions, as appropriate, compared migraine group and adjusted for age, gender, race, education, comorbidities, and country. **RESULTS**: Of 63,001 invitees, 20,987 responded. A total of 9,118 completers (14.5%) comprised the final cohort [n = 516 (Australia) to 1597 (US)]; 83.6% female; 5.5% CM, 90.2% EM. CM respondents were 1.4 times more likely than EM to report that they had missed any work/school due to headache (95% CI = 1.1, 1.8). CM reported missing a higher number of work/school days due to headache symptoms than EM (adjusted mean ± SE = 8.83 ± 0.59 vs. 4.05 ± 0.44, $p < 0.0001$), as well as working more days

with headache symptoms (16.97 ± 0.54 vs. 5.38 ± 0.39, $p < 0.0001$). CM also missed more days due to illnesses other than headache than EM participants (13.66 ± 1.98 vs. 9.33 ± 1.42, $p < 0.01$). CM and EM reported working at about half of their full effectiveness with headache symptoms ($p > 0.05$). CM reported experiencing more impairment on work ability or activity than EM (CM = 31.1%, EM = 24.4%), or requiring more bed rest (CM = 33.5%, EM = 26.2%) when experiencing severe headaches. **CONCLUSIONS**: Migraine adversely affected presenteeism and increased absenteeism of migraine sufferers, particularly among those with CM, who missed more days and worked more days with headache than EM.

PND14

COSTS OF ILLNESS IN PARKINSON'S DISEASE IN SIX EUROPEAN COUNTRIES

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OBJECTIVES: To evaluate the direct and indirect costs of Parkinson´s Disease (PD) in a survey of five European countries and Russia. So far, cost-of-illness (COI) studies on PD have been conducted in some European countries only, none in Austria, Czech Republic, Portugal and Russia. The prevalence of PD in Europe varies between 115 and 221 per 100,000, due to aging of population the number of persons affected is expected to double within the next 25 years. **METHODS**: Between 2003—2005 about 100 patients of PD were recruited per study center. Clinical status (Hoehn & Yahr stage, Unified Parkinson's Disease Rating Scale) was evaluated. Economic data were collected over a 6 months period using the "bottom-up" approach. Indirect costs were calculated by the human capital approach. Informal care was monetary valued. **RESULTS**: The total mean costs per patient ranged from €2620 to €9812 for the 6-months observation period. Direct costs made about 60% to 70%, indirect costs made 30% to 40% of total costs. Forty-seven percent to 92% of direct costs were on the account of the national health insurance systems. Patients' co-payments constituted up to 14% of direct costs. Informal care generally was the prevalent form of care for PD patients. In half of the participating countries it was the major source of expenditure. **CONCLUSIONS**: This is the first observational study on the burden of PD across European countries and Russia. Costs of PD across Europe vary considerably. Reasons are multiple; differences in prices, health systems and traditions are some. PD represents a major burden on the individual, family, health services and society in Europe, especially in Eastern European countries. A major cost factor is the cost for care, which has enormous importance due to demographic development and extension of life expectancy.

PND15

THE POTENTIAL ECONOMIC IMPACT OF GENERIC SUBSTITUTION OF TOPIRAMATE ON HEALTH CARE COSTS IN THE G4 EUROPEAN COUNTRIES

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OBJECTIVES: To examine the economic impact of generic substitution of the anti-epileptic drug (AED) Topiramate in Canada; and convert observed Canadian costs into the settings of France, Germany, Italy and the UK (UK). **METHODS**: Retrospective health claims from Québec's provincial health plan (RAMQ) between January 2006 and September 2008, and IMS Health data on European AED sales between 1998 and 2008 were used. Patients with epilepsy (ICD-9: 345, 780.3, 780.39) and ≥2 topiramate dispensings were selected. Patient-level health care utilization costs in Canada were calculated during mutually-exclusive periods of brand versus generic use of topiramate. Annualized Canadian health care costs were projected in each country (€2007/person-year) using Canadian rates, European prices and service-use ratios. Using market-level sales, topiramate utilization were forecasted for 12 months following expected generic entry (September 2009-September 2010) using autoregressive and panel-data regression models. The impact of generic entry was projected for each country, stratified into its effect on market size, topiramate costs, and other health care costs. **RESULTS**: A total of 1164 patients (mean age: 39.8 years, 61.7% female) were observed for 2.6 years on average. Projected per-patient health care costs in G4 European countries, excluding Topiramate, would be significantly higher during generic-use periods (adjusted cost differences per person-year: €706 to €815, $p < 0.001$ for all comparisons) compared to brand-use periods. Assuming mandatory generic substitution for all patients, predicted system-wide increases in total adjusted health care costs would range from 3.5% (UK) to 24.4% (France) one year after generic entry. Increases in non-Topiramate health care costs (+13.7% to +18.1%) would more than offset savings in incremental Topiramate brand costs (−6.3% to −13.8%) in France, Italy, and the UK. **CONCLUSIONS**: The generic entry of Topiramate in Europe is projected to be associated with higher health care costs, representing a trade-off between reduced generic drug expenditures and increased health care costs.

PND16

ECONOMIC IMPACT OF GENERIC ENTRY OF TOPIRAMATE IN GERMANY: CONVERSION OF THE CANADIAN EXPERIENCE INTO THE SETTINGS OF GERMANY

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OBJECTIVES: investigated the impact of generic substitution of the branded antiepileptic drug (AED) Topiramate (Topamax®) on medical service utilization and costs for patients with epilepsy in Germany. **METHODS**: Retrospective health claims from Québec's provincial health plan (RAMQ) between January 2006 and September 2008 were analyzed. Patients with epilepsy (ICD-9: 345, 780.3 or 780.39) and ≥2 topiramate (Topamax®) dispensings were selected. Patient-level health care utilization and costs in Canada were calculated during mutually-exclusive periods of brand versus generic use of topiramate. Annualized Canadian health care costs were converted into a German setting (€2007/person-year) by applying purchasing power parities, service-use ratios and exchange rates. Using market-level sales, branded and generic topiramate utilization were forecasted for 12 months following expected generic entry (September 2009-September 2010) using autoregressive and panel-data regression models. Non-parametric bootstrap procedure was used to determine statistical significance for the cost measures. Budgetary consequences for sick funds, individual and private payers were assessed. **RESULTS**: After adjusting for covariates, periods of generic topiramate use were associated with significant increases in pharmacy dispensings (other AEDs: +6%, non-AEDs: +31%, $p < 0.001$), a 17% increase in hospitalizations ($p = 0.015$), and 21% longer lengths of hospital stays ($p < 0.001$). Converted per-patient health care costs excluding topiramate were estimated to be significantly higher for generic relative to brand periods in Germany (adjusted cost difference per person-year [95% CI]: €710 [€149–€1283]; $p = 0.001$). Assuming mandatory generic substitution for all patients, predicted system-wide increase in total adjusted health care costs would be 23.2% one year after generic entry. This impact would be evenly distributed among payers. **CONCLUSIONS**: Generic entry of topiramate in Germany would represent a trade-off between reduced generic drug expenditures and increased health care costs due to higher AED and non-AED spending, as well as increased hospitalizations and outpatient visits. Increased total cost is expected to outweigh the benefit of reduced drug costs.

PND17

THE COST-EFFECTIVENESS OF DEEP BRAIN STIMULATION IN PARKINSON'S DISEASE PATIENTS

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OBJECTIVES: In addition to medical treatment, deep brain stimulation (DBS) has become an alternative therapeutical option in advanced Parkinson's disease, especially for motor complications such as dyskinesias or motor fluctuations. High initial costs of surgery and subsequent time-consuming maintenance procedures may be traded off by long-term gains in quality of life (HrQoL) compared to conventional medication treatment. This leads to the question whether DBS is cost effective compared to best medical treatment. **METHODS**: We present a lifetime Markov model for Parkinson's disease, comparing deep brain stimulation vs. best medical treatment and estimating the impact on health-related quality of life. HrQoL was measured by the EQ-5D and cost from the societal perspective of Germany. Both were discounted with 3% p.a.. Data on DBS efficacy and adverse events were taken from clinical studies and published reports or meta-analyses. Key assumptions on the surgery procedure and its durability, its impact on cost and HrQoL, mortality, prevalence of motor complications as well as stage transition probabilities and the discount rate were investigated by one- and two-way sensitivity analyses. **RESULTS**: The incremental cost effectiveness ratio (ICER) for DBS was €42,183 per QALY gained. Incremental DBS costs were due to cost for surgery and subsequent battery change. HrQoL was improved and motor complications were reduced. The following variables had most impact in sensitivity analyses: utility improvement under DBS, drug and surgery cost, progression rates, and discount rate leading to varying ICERs between 20,064 and €58,147/QALY (the latter due to extreme and unlikely parameter combinations). **CONCLUSIONS**: Based on our decision analysis using current guidelines, DBS is likely to be cost-effective compared with other well-accepted health care technologies. We suggest to adopt DBS for patients with high drug cost or severe motor complications.

PND18

COST-EFFECTIVENESS OF A NEW ABSORBABLE HYDROGEL FOR THE PREVENTION OF CSF LEAKS IN FRENCH HOSPITALS

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OBJECTIVES: The objective was to demonstrate the cost-effectiveness of a new absorbable hydrogel used in craniotomies compared to the option "do nothing" in France. **METHODS**: A Markov model was fed with clinical data from Grotenhuis and al. (Surg. Neurol. 2005;64:490–3) and with cost data from the French cost database (2006 data based on DRG (GHM) 01C04V craniotomy without complication and 01C04W craniotomy with complication). The model was run with three stages (T0: date of surgery; T1: 1-month follow-up; T2: 3-month follow-up) and three states